



## Global BioSciences LLC

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### **GBS Technologies Synopsis:**

Global BioSciences LLC (GBS) has developed an effective and efficient way to clean contaminated sites of many types of dangerous chemical contaminants, via a proprietary and patented “Bio-Activation” process. The GBS process has been applied, field tested and EPA certified, on diverse chemical variations of contaminated sites. The GBS technique has effectively cleaned polluted groundwater and soils of a wide variety of contaminated sites without the high cost, side effects, and long lead times associated with conventional remedial process and technologies.

In recent years, “bioremediation” has developed a somewhat negative connotation of which in many cases, was due to negligible results derived from the introduction of incubated/manufactured microbes which were supposedly designed to “eat away” the specific contaminants. This form of remediation was popularized with oil or hydrocarbon related contaminated sites or waterway related spills. Problems arose when foreign microbes were introduced into the environment with very high mortality rates and high failure rates. In addition, very high costs were associated with the purchase of these “manufactured” microbes.

The GBS process and results are totally different from the introduction of “foreign/manufactured” microbes and are the result of a special design. Our GBS process activates very low populations of indigenous (on site natural) microbes, which then exponentially propagate whole microbial colonies through an “Accelerated Attenuation Process” (AAP). When this is done, using a special combination of ingredients and delivery mechanisms, effective solutions occur. Depending on the specific type(s) of contaminants, as well as the surrounding geologic and/or hydrologic conditions, GBS can resolve contaminant problems quickly and with precision accuracy.

Although our GBS technology is a natural, safe, and clean process, to label it simply as a “natural attenuation” process does not adequately describe it. The term “natural attenuation” usually refers to just leaving the contaminants remain as is, in the “natural” environment, while just letting naturally occurring microbes passively “attenuate” contaminants on their own. This process takes considerable time, sometimes decades, or longer resulting in marginally low reductions of most chemical contaminants. Our GBS process exponentially speeds up this “natural” microbial action to an economically functional pace and can reduce large volumes of chemical contaminants quickly and effectively, without the high cost, slow remediation time and adverse side effects associated with other conventional processes.

Other types of “conventional” technologies are known to leave negative environmental side effects such as the creation of greenhouse gas emissions, due to using physical types of processes including, but not limited to excavation (dig and treat), SVE (Soil Vapor Extraction) and air stripping (pump and treat). These methods use fossil fuel generated pumps and equipment to “physically” remove the contaminants, resulting in high expenses with minimal results. They also are known, in many cases to leave other contaminants behind (side effects).

Unlike GBS, these older technologies take considerable amounts of time to bring even minimal reductions of the targeted contaminated materials and are very costly in time and labor.

GBS is especially effective for post removal of leaking tanks and where concentrated plume areas have migrated to pollute very large areas and/or groundwater resources. GBS’s Bio-Activation and “Accelerated Attenuation Technologies” works effectively in a shorter time frame and with lowered cost. Our system works on the most difficult of contaminated sites in a clean, safe and efficient manner, where most fail to meet expectations and EPA closure requirements.

#### **Main Advantages of GBS Soil and Groundwater Technologies:**

- 1) An effective, clean, environmentally safe solution for complex chemical contaminated sites, achieving positive overall results
- 2) Economic benefits occur during the actual remediation as well as post-remediation due to low, long-term recovery costs

The above advantages of the GBS process coincides with the LEED (Leadership in Energy and Environmental Design) “triple bottom line” criteria, established by the U.S. GBC (Green Building Council) a respected leader in environmental policies.

#### **The LEED Triple Bottom Line criteria:**

- 1) Environmental sustainability (process and results have to be “Green” )
- 2) Economic Viability (Process has to be “cost effective” no diminishing return issues)
- 3) Morally & Socially Responsible (Process has no detrimental side effects and issues)

GBS is proud to achieve all 3 of the LEED Triple Bottom Line criteria’s.

#### **In Conclusion:**

It has been already proven that the GBS “AAT” process will be the front-runner in the remediation industry to clean up chemical contaminants in the ground water and soils. After all the facts and details are known to stakeholders and those who are liable for contaminated sites around the globe, GBS will be the “go-to” remedial solution for a considerable percentage of difficult to clean contaminated sites, thereby making it the most effective remediation technology known and the process of choice.